TITLE

POP-OUT OUTLETS FOR HOUSINGS

CROSS-REFERENCE TO RELATED APPLICATION

This application is a division application of the co-pending U.S. patent application serial no. 10/313,312, filed December 6, 2002.

This application claims the benefit of U.S. provisional patent application serial no. 60/338,229 filed December 6, 2001.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to housings, and more particularly to pop-out or pop-up outlets for electronics housings, and most particularly to pop-out or pop-up outlets for surge protection devices.

2. Discussion of the Related Art

Electrical outlets on electronics housings are well known in the art. Surge protection devices are also well known in the electronics art as being desirable and/or necessary for protecting sensitive electronic devices from surges of current: whether over line cords, telephone lines, or other connections. A common problem with electronics housings and surge protection devices of all types is they never seem to have enough outlets to protect the desired number of devices.

The electronics housings and surge protectors known in the art generally have a fixed number of outlets or receptacles, or require nodules to be added to provide additional outlets or receptacles. This may increase the size of the housing or the surge protection device, and may increase the overall cost of the housing or surge protection device. Thus, those skilled in the art have continued to search for ways to have additional outlets or receptacles present which do not take up space when not needed, and do not require the addition of modules or other devices to the basic housing or surge protector device.

SUMMARY OF THE INVENTION

The present invention solves the problems present in the art by providing pop-up, pop-out or otherwise extendable outlets for electronics housings and surge protection devices such as, for example, line cord surge protectors, telephone line surge line protectors, network surge protectors, co-ax surge protectors, and other types of surge protectors known in the art. With the pop-out outlets in their retracted position, the overall size of the device is not increased, and when the pop-out outlet is "popped-out" of the housing to expose additional outlets or connectors, only then is the size of the device increased, and without additional cost.

Thus, it would be advantageous to provide additional pop-out outlets or connectors in an electronics housing or surge protection device.

Further advantages of the present invention will be apparent from the following description and appended claims, reference being made to the accompanying drawings forming a part of the specification, wherein like reference characters refer to corresponding parts in the several views.

DESCRIPTION OF THE DRAWINGS

The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of a preferred embodiment when considered in the light of the accompanying drawings in which:

Fig. 1 is a perspective view of a construction embodying the present invention;

Fig. 2 is a perspective view of a modification of the present invention showing two pop out outlets, both in their retracted position;

Fig. 3 is a perspective view of the-construction shown in Fig. 3 with one of the pop out outlets or connectors shown in its extended or popped-out position;

Fig. 4 is a diagrammatic view of the construction shown in Fig. 2;

Fig. 5 is an electrical schematic showing the electrical connections for the construction shown in Fig. 5;

Fig. 5A is a perspective view of a construction embodying the present invention;

Fig. 6B is a perspective view of an alternative condition of the construction shown in Fig. 6A;

Fig. 7 is an exploded perspective view of the construction shown in Fig. 6A;

Fig. 7A is an exploded perspective view of an alternative condition of the construction shown in Fig. 7;

Fig. 8 is a perspective view of a construction embodying the present invention;

Fig. 9 is a perspective view of a construction embodying the present invention;

Fig. 10 is a perspective view of a construction embodying the present invention;

Fig. 11 is a perspective view of a construction embodying the present invention;

Fig. 12 is a perspective view of an alternative condition of the construction shown in Fig. 11;

Fig. 13 is a perspective view of an alternative condition of the construction shown in Fig. 11; and

Fig 14 is an exploded perspective view of the construction shown in Fig. 11.

DESCRIPTION OF THE PREFERRED EMBODIMENT

It is to be understood that the invention may assume various alternative orientations and step sequences, except where expressly specified to the contrary. It is also to be understood that the specific devices and processes illustrated in the attached drawings, and described in the following specification are simply exemplary embodiments of the inventive concepts defined in the appended claims. Hence, specific dimensions, directions or other physical characteristics relating to the embodiments disclosed are not to be considered as limiting, unless the claims expressly state otherwise.

Referring now to Fig. 1, there is shown a surge protection or other electronic housing device, generally designated by the numeral **20**, for example, for protecting devices connected to line current from electrical surges. There is shown a line cord **21** for connection to a source or power and a surge protector housing **22** having a plurality of electrical outlets or connectors **19** to receive a standard three-prong line cord plug (not shown).

It should be understood than the present invention may be used for any electronics housing **22**. By way of example only, an electronics housing having surge protection located therein will be described. It should also be understood that the present invention is not limited to providing additional line cord outlets, but is broad in scope and is intended to provide additional pop-out electrical outlets or connectors of any kind, such as RJ11 **56** (Fig. 8), RJ45 **58** (Fig. 9) and co-ax **60** (Fig. 10) connectors, needed to protect any type of electrical devices from surges. Such pop-out outlets or connectors are well within the scope of the present invention.

By way of the present example, surge protector housing **22** has at least one extendable housing portion **23** which slides in and out of an opening **24** provided on the housing **22**. A further plurality of electrical outlets or connectors **25** are formed in the top planar surface of the extendable housing portion **23** and may be of any desired type or number. Preferably, at least one electrical connector **25** is exposed when the extendable housing portion **23** is retracted into the housing such as in the embodiment depicted in Figs. 2 and 3.

As an example of the wide range of surge protection devices which are within the scope of the present invention, there is shown in Fig. 2 and Fig. 3 a perspective view of another electronic housing device in the form of a base unit for a stackable USB hub **29**, which may be such as shown in applicant's co-pending application Serial No. 60/169, 255, which is incorporated herein by reference.

The base unit **29** has a housing **30**, a first pop-out outlet **31**, and a second pop-out outlet **32**. A line cord **33** provides power to the device and is connected through on/off switch **34** to a surge protection device **35** (Figs. 4 and 5). Additional snap-in or slide-in housing portion modules may be provided in openings (**40**, **41**) in a rear panel **30a** if desired.

The surge protection device **35** protects ground and/or the hot and neutral connectors or wires.

Referring now to Fig. 4, there is shown a diagrammatic view of the base unit **29** which comprises the housing **30**, the electrical power cord **33**, the power on/off switch with breaker **34**, the surge protector board **35**, the two pop-out outlet modules **31** and **32**, and the associated wiring.

To operate, the base unit **29** receives power from the attached power cord **33** which is connected to a 120 volt alternating current power source. Internally, the signal is connected to an input connection **52** of the power switch **34** which allows the user to turn power on or off to the base unit **29**. From this point on the incoming neutral and ground signals, along with the hot signal from a power switch **34** output connection **54**, are connected to the surge protector board **35**, and then passed on to the two pop-out outlet modules **31**, **32**.

To protect external electrical equipment from power surges, a user could connect a power cord from the external electrical equipment into a pop-out power outlet, for example, **50**. If a surge is detected in the wiring, the surge protector board **35** will direct that surge to ground before the surge can damage the external equipment.

Next referring to Fig. 5, there is shown the electrical schematic of the base unit **29**. Power enters the base unit through the power cord **33**. The hot signal is wired to the input connection **52** of the power switch **34**. Then the incoming neutral and ground signals, along with the hot signal of the output connection **54** of the power switch **34**, are passed onto the pop-out outlets **31**, **32**, and the surge protector board **35**. To use the present invention a user could connect external electrical equipment into a pop-out power outlet, for example, the outlet **50**. If a surge is detected in the wiring, the surge protector board **35** will direct that surge to ground before the surge can damage the external equipment.

As depicted in Figs. 6, 6A, 6B, 7 and 7A, an extendable housing portion **42** may slide in and out of the opening **41** on complementary rails **62** provided in the housing **30** and on the housing portion **42** by means well known in the art, and may have a spring loaded pop-out feature **64**, or may simply be extended and retracted like a common drawer in the housing **30**. The pop-outlets **31** and **32** and the opening **40** are not shown in thee views. The housing **30** has at least one stop **66** in mechanical communication with the housing to prevent the extendable housing portion **42** from extending beyond a predetermined distance **68** from the housing **30** as shown in Figs. 6 and 6A. Preferably, manual means **70**, such as a human finger, are used to locate the extendable housing portion **42** back into the housing **30**. As depicted in Figs. 6B and 7A, at least one outlet or connector **25** is preferably accessible when the extendable housing portion **42** is retracted in the housing **30**, however,

embodiments where the outlet or connector **25** is not accessible are also well within the scope of the invention.

Suitable electrical connections as depicted in Figs. 4 and 5, also well known in the art, are provided in the housing to connect the outlets or connectors 25 to the surge protection circuitry **35** which may be provided in the housing **30**, and, in turn, to the line cord **33**.

Figs. 11-14 depict an alternative embodiment electronic housing device **72** of the present invention wherein the extendable housing portion **42**, as described above, swings or rotates into and out of an opening **44** in a rear panel **30b** of the housing **30** on at least one hinge **74**. The extendable housing portion **42** may be hinged on either end to allow the housing portion to swing out from either side of the opening **44**. Additionally, although the extendable housing portion **42** is depicted as swinging out in a substantially horizontal fashion, it is well within the scope of the invention to allow the extendable housing portion **42** to be hinged at either its top or bottom. Hinges at the top or bottom of the extendable housing portion **42** allow it to swing into and out of the housing along a substantially vertical plane. The extendable housing portion **42** may have at least one of the outlet or connector **25** accessible when the extendable housing portion **42** is located within the housing **30**.

Manual or automated means may be used to extend the extendable housing portion into and out of the housing.

Thus by carefully studying the problems existing in present day electrical devices, a novel apparatus is provided for providing additional electrical connectors or outlets.

In accordance with the provisions of the patent statutes, the present invention has been described in what is considered to represent its preferred embodiment. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.